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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/819,781	03/28/2001	Michael S. Davis	PA-Y0068	2621

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EXAMINER

PHAN, HUY Q

ART UNIT PAPER NUMBER

2685

DATE MAILED: 02/27/2004

2

Please find below and/or attached an Office communication concerning this application or proceeding.

2

# Office Action Summary

Application No.

09/819,781

Applicant(s)

DAVIS ET AL.

Examiner

Huy Q Phan

Art Unit

2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description:  
-- S(d) -- in figures 1 and 2. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 5 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Dartois (US-2002/0047746 A1)

Regarding claim 1, Dartois discloses in figure 2, a signal processing apparatus comprising: circuitry for digitizing an input signal (10'); a software linearizer (40, 42) for processing the digitized signal to produce a pre-distorted RF signal that is to be subsequently amplified to produce a signal that has reduced intermodulation distortion

Art Unit: 2685

(page 3, [0048] and page 4, [0049]); circuitry for converting the pre-distorted RF signal to an analog signal (12'); and a nonlinear amplifier (14') for amplifying the pre-distorted analog signal to produce an output signal corresponding to the input signal that has reduced intermodulation distortion.

Regarding claim 5, Dartois discloses in figure 2, a pre-amplification linearization method comprising the steps of: digitizing an input signal (10'); processing the digitized signal (42, 40) to produce a pre-distorted RF signal that is to be subsequently amplified to produce a signal that has reduced intermodulation distortion (page 3, [0048] and page 4, [0049]); converting the pre-distorted RF signal to an analog signal (12'); and amplifying (14') the pre-distorted analog signal to produce an output signal corresponding to the input signal that has reduced intermodulation distortion.

Regarding claim 6, Dartois discloses the method according to claim 5 as recited in the rejection of claim 5, wherein the processing step comprises processing the digitized signal using a pre-amplification software linearizer (40, 42) to produce the pre-distorted RF signal (page 3, [0048] and page 4, [0049]).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 2685

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dartois in view of Cova (US-6,141,390).

Regarding claim 2, Dartois discloses all the limitations of a signal processing apparatus according to claim 1, as recited in the rejection of claim 1. But, Dartois does not expressly show an upconverter for upconverting the pre-distorted analog signal; a linear amplifier for amplifying the pre-distorted signal; a bandpass filter for filtering the pre-distorted signal; and a transmit antenna for transmitting the filtered pre-distorted signal. However, Cova discloses in figure 4, an upconverter (413) for upconverting the pre-distorted analog signal; a linear amplifier for amplifying the pre-distorted signal (103); and a transmit antenna (105) for transmitting the pre-distorted signal. Since, both Dartois and Cova disclose the method for linearizing transmission of wireless communication; therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system by specifically having an upconverter for upconverting the pre-distorted analog signal; a linear amplifier for amplifying the pre-distorted signal; and a transmit antenna for transmitting the pre-distorted signal as taught by Cova into the system of Dartois for the purpose of improving the quality, cost and reliability of the signal processing apparatus.

Dartois and Cova fail particularly to recite a bandpass filter for filtering the pre-distorted signal. However, it is a well known in the art to use a bandpass filter for decreasing a bandwidth to a desired bandwidth in order to conserve the bandwidth and power of wireless communication system.

Regarding claim 3, Dartois discloses all the limitations of a signal processing apparatus according to claim 1. But, Dartois does not explicitly teach a receive antenna for receiving the pre-distorted signal; a low noise amplifier for amplifying the received pre-distorted signal; a downconverter for downconverting the pre-distorted signal; and a channel amplifier for amplifying the pre-distorted signal and coupling it to the nonlinear amplifier. However, Cova discloses in figure 4, a receive antenna for receiving the pre-distorted signal (105); a downconverter (423) for downconverting the pre-distorted signal. Since, both Dartois and Cova disclose the method for linearizing transmission of wireless communication; therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system by specifically having a receive antenna for receiving the pre-distorted signal; a downconverter for downconverting the pre-distorted signal as taught by Cova into the system of Dartois for the purpose of improving the quality, cost and reliability of the signal processing apparatus.

Dartois and Cova fail particularly to recite a low noise amplifier for amplifying the received pre-distorted signal; and a channel amplifier for amplifying the pre-distorted signal and coupling it to the nonlinear amplifier. However, it is a well known in the art to use low noise amplifier or channel amplifier in a proper process of amplification in order to maintain the signal strength.

Regarding claim 4, Dartois discloses all the limitations of a signal processing apparatus according to claim 1. But, Dartois does not expressly show an upconverter for upconverting the pre-distorted analog signal and coupling it to the nonlinear amplifier; a bandpass filter for filtering the output signal having reduced intermodulation distortion; and a transmit antenna for transmitting the filtered output signal having reduced intermodulation distortion. However, Cove discloses in figure 4, an upconverter for upconverting the pre-distorted analog signal and coupling it to the nonlinear amplifier (103); and a transmit antenna (105) for transmitting the filtered pre-distorted signal. Since, both Dartois and Cove disclose the method for linearizing transmission of wireless communication; therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system by specifically having an upconverter for upconverting the pre-distorted analog signal and coupling it to the nonlinear amplifier; and a transmit antenna for transmitting the signal as taught by Cova into the system of Dartois for the purpose of improving the quality, cost and reliability of the signal processing apparatus.

Dartois and Cova fail particularly to recite a bandpass filter for filtering the pre-distorted signal. However, it is a well known in the art to use a bandpass filter for filtering out unwanted signal before the signal is transmitted in order to conserve the bandwidth and power of wireless communication system.

### ***Conclusion***

Art Unit: 2685

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a) Jeong (US-6,515,712) discloses signal distortion compensating apparatus.
- b) Kenington (US-6,583,739) discloses forward distortion reduction system.
- c) Cox et al. (US-5,732,333) disclose linear transmitter using predistortion.
- d) Leyendecker (US-5,867,065) discloses frequency selective predistortion in a linear transmitter.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huy Q Phan whose telephone number is 703-305-9007. The examiner can normally be reached on 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Urban F Edward can be reached on 703-305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HP  
Feb. 12, 2004

  
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PATENT EXAMINER  
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